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## AFRL, Delphi sign collaboration deal for brakes

by Anne Gunter, AFRL Public Affairs

WRIGHT-PATTERSON AFB, Ohio — The Air Force Research Laboratory (AFRL) joined forces with an automotive industry leader recently to begin a revolutionary research and development project called “Brake by Wire.”

During a press conference at the Miami Valley Research Park in Kettering, Ohio, AFRL and Delphi Automotive Systems signed a collaborative agreement to bring this new technology to the automotive industry. Together with Delphi, AFRL is to design, build and demonstrate a viable “brake by wire” system on a drivable vehicle within the next two years. Representative Tony Hall, D-Dayton, state Sen. Jeff Jacobsen, R-Phillipsburg, Ron Wine, president of the Miami Valley Economic Development Coalition, and Robert May, AFRL executive director delivered remarks during the event.

“Brake by wire” is defined as a next generation braking system that will stop a vehicle by electrical signals versus the conventional hydraulics systems on cars today.

AFRL’s Air Vehicles, Materials and Manufacturing, and Propulsion directorates each are key players in this agreement. They bring forward specific technologies that will work in creating the brake by wire system.

The Air Force has a keen interest in how this project unfolds. One of the benefits from this agreement is the chance to prove that the various systems utilizing these key technologies have viable commercial applications outside of the Air Force. “Our interests are in validating the technology on high temperature power applications, control theory, reliable wiring and connectors for applications on aircraft and other aerospace systems,” said George Schmitt, Chief Integration and Operations Division, Materials and Manufacturing directorate, and project lead for AFRL. “We anticipate that the technologies that are applied to ground vehicles would likewise be of use for ground-based defense systems.”

Another possible benefit is the cost reduction of components for Air Force systems. “The automotive industry has a large quantity buy which will drive down the cost of more electric (ME) systems and make them more affordable,” said Joseph Weimer, Chief of the Electrical Technology and Plasma Physics Branch, Propulsion directorate.

The ME system utilizes fault tolerant electrical power and power electronics to drive aircraft sub-systems in lieu of less reliable hydraulic, pneumatic and mechanical power systems. Weimer has been working with this system since the early 1990s in the Propulsion directorate. “We have been researching the use of ME power to do more and more functions within the weapon systems. Delphi is interested in doing the same thing for automobiles. I am really excited about this opportunity - this is a real boost for us,” he said. In 1999, the Miami Valley Economic Development Coalition undertook an automotive and manufacturing competitiveness study as part of its automotive initiative. This study pointed to “brake by wire” systems as a critical technology for Ohio’s automotive and aerospace industries. The Coalition then brought together AFRL and Delphi through the Wright Technology Network, the Edison Materials Technology Center and NCIC Capital Fund to make this partnership happen.

“Currently, the motor vehicles industry is the largest employer in Ohio,” said Marty Hohenberger, director for the automotive initiative at the Coalition. “By leveraging off of the region’s core strengths in aerospace and automotive, we have an exciting opportunity to increase Ohio’s economic base, lead new product development and bring a host of benefits to the consumer.”

Federal, state and industry dollars are coming together to make this project a fiscal success. Federal dollars total \$1.8 million, the state has earmarked \$1 million, and Delphi is bringing forward approximately \$1.2 million.

Robert May, AFRL executive director, believes these partnerships are vital to ensure affordable technologies and a strong industrial base to support defense needs. “The Miami Valley Economic Development Coalition are to be congratulated for facilitating this arrangement that is clearly a win-win-win for the Air Force, for Delphi, and for the local community,” he said. @